

# New Brunswick, New Jersey, Site



## SITE CERTIFICATION SUMMARY

This Site Certification Summary provides information about the **New Brunswick, New Jersey, Site**. The U.S. Department of Energy Office of Legacy Management is responsible for long-term stewardship of the site under the **Formerly Utilized Sites Remedial Action Program**.

### Site Description and History

The New Brunswick, New Jersey, Site (NBS) is a 5.6-acre property in an industrial area 1.6 miles from downtown New Brunswick, New Jersey. From 1948 to 1977, NBS was used as a general nuclear chemistry laboratory for work related to government reactor and weapons programs. During 29 years of operation, NBS provided a variety of services using nuclear materials, such as thorium and uranium ores, high-purity plutonium, americium, and enriched uranium. In 1960, soil contaminated with residues from pitchblende was moved to the site from the Middlesex Municipal Landfill. The material was mixed with clean soil and used to fill an unused rail spur that entered the eastern side of the property. In 1977, the New Brunswick facility closed, and laboratory operations and personnel relocated to the Argonne National Laboratory (ANL). In 1990, NBS was transferred into the Formerly Utilized Sites Remedial Action Program (FUSRAP) from the Decontamination and Decommissioning Branch of the U.S. Department of Energy (DOE) Office of Eastern Area Programs.

### Site Remediation Timeline

- 1978** — Phase I of remediation included removal of contaminated accessible plumbing, equipment, and portions of floors, walls, and ceilings.
- 1980** — Radiological characterization revealed residual contamination in on-site sewer lines and better defined the extent of soil contamination.
- 1981-1983** — Phase II of remediation included removal of all aboveground structures, contaminated concrete foundations, drain lines, and soils.
- 1989** — ANL identified localized areas that were still contaminated.
- 1990** — Site was designated for remediation under FUSRAP.
- 1996** — Remediation was completed.
- August to November 1996** — Oak Ridge Institute for Science and Education completed verification surveys.
- September 24, 2001** — DOE published a notice of cleanup certification in the Federal Register.
- 2004** — DOE transferred responsibility for NBS to the DOE Office of Legacy Management (LM).



*Soil-processing technology used at the New Brunswick site (1996).*

*Areas and depths of contamination at the New Brunswick site.  
(Click image to enlarge.)*

## Certification Docket Contents

The material in the [Certification Docket](#) includes information and documents supporting the successful certification that conditions at the property comply with radiological guidelines in effect at the conclusion of remedial action. Furthermore, this certification docket substantiates that the future use of the property will not produce any significant radiological hazard or dose to the general public as a result of residual radioactivity remaining on-site that originated during activities conducted by DOE or its predecessor agencies.

## Remedial Action

Remedial activities at the New Brunswick site were performed in 1978 (Phase I) and 1981 through 1983 (Phase II). Remediation was then completed in 1996 as part of FUSRAP. During remediation, soil segregation technology was used to sort excavated soil above or below the designated criteria. See the [Fact Sheet](#) for details.

## Post-Remediation Sampling

Post-remedial action surveys included walkover gamma radiation measurements and sampling and analysis of soils from the remediated area. The post-remedial action sampling at NBS covered three distinct areas: the excavation area, the western two-thirds of the site that had been previously remediated, and the clean effluent of the segmented gate system (soil processor). DOE analyzed all post-remedial action samples for uranium-238, radium-226, and thorium-232 and only 15% of samples for americium-241 and plutonium-239, since past remediation efforts already addressed these last two radionuclides. Chemical samples were analyzed for volatile organics, pesticides, herbicides, metals, inorganics, semivolatiles, and polychlorinated biphenyls. In addition to the post-remedial action surveys, extensive groundwater monitoring was conducted from 1992 through 1996.

For more detailed results of the post-remediation sampling, please see the [Site Certification Data Summary Worksheet](#) on pages 3-7. For a more detailed map of the site and sampling locations, see the [Site Overview Map](#) on page 8.

Because the remedial activities at the New Brunswick site took place before October 1997, residual contamination guidelines from DOE Order 5400.5, "Radiation Protection of the Public and the Environment" were met. Sites remediated after October 1997 must meet the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300).

## Current Site Conditions

All post-remedial action surveys and sampling results from the excavation area and clean effluent from the segmented gate system indicated that levels of radioactivity in the remediated areas meet applicable DOE cleanup guidelines and proposed New Jersey S-1070 chemical standards. Groundwater monitoring indicated that the site groundwater does not

exceed DOE Derived Concentration Guidelines for radiological constituents. Neither federal nor state maximum contaminant levels nor New Jersey Class-IIA Groundwater Quality Standards were exceeded for water quality criteria, polychlorinated biphenyls, or total petroleum hydrocarbons in site groundwater. An independent radiological verification survey verified that the residual uranium contamination at the New Brunswick site is below DOE FUSRAP guidelines for unrestricted use.

Excavation is restricted in the northeast portion of the site where a layer of clean soil covers soils containing arsenic (noted as the institutional control area on the [Site Overview Map](#) on page 8). The owner inspects this restricted area every other year and submits a certification of protectiveness to the state of New Jersey

DOE has been responsible for long-term stewardship of the New Brunswick site since 2001. The stewardship requirements and protocols are captured in the FUSRAP Long-Term Surveillance and Maintenance Plan, which is available on the LM website ([www.energy.gov/lm/new-brunswick-new-jersey-site](http://www.energy.gov/lm/new-brunswick-new-jersey-site)).



## ADDITIONAL INFORMATION

Documents related to FUSRAP activities at the New Brunswick, New Jersey, Site are available on the LM website at [lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename>New\\_Brunswick](http://lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename>New_Brunswick).

For other information on site history or current long-term stewardship activities, please contact us at:  
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 [www.energy.gov/lm](http://www.energy.gov/lm)

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# New Brunswick, New Jersey, Site Certification Data Summary Worksheet

Five tables in the New Brunswick Certification Docket provide the evidence used to certify the site as clean.

When the tables refer to the "Post-Remedial Action Report," that is the "Post-Remedial Action Report for the New Brunswick Site, New Brunswick, New Jersey" (dated July 1997).

NBS - Post-Remedial Action Gamma Walkover Scan and External Gamma Exposure Rate Data Ranges																			
Table 4-1 in Post-Remedial Action Report																			
	Walkover cpm X 1000		Exposure Rate ( $\mu\text{R}/\text{h}$ )			Walkover cpm X 1000		Exposure Rate ( $\mu\text{R}/\text{h}$ )			Walkover cpm X 1000		Exposure Rate ( $\mu\text{R}/\text{h}$ )			Walkover cpm X 1000		Exposure Rate ( $\mu\text{R}/\text{h}$ )	
Grid	Low	High	Low	High	Grid	Low	High	Low	High	Grid	Low	High	Low	High	Grid	Low	High	Low	High
S-1	8	13	10.0	11.3	S-32	6	16	11.6	13.7	S-63	12	19	12.7	14.7	S-94	9	16	11.0	12.8
S-2	8	14	9.8	12.8	S-33	6	14	9.3	11.3	S-64	11	19	11.8	14.0	S-95	11	18	10.2	12.2
S-3	10	15	10.3	12.2	S-34	7	15	9.8	11.8	S-65	7	17	9.2	10.8	S-96	11	16	11.0	12.3
S-4	10	15	10.5	12.6	S-35	11	17	10.2	12.2	S-66	9	17	10.0	12.2	S-97	12	20	10.2	12.5
S-5	11	18	12.8	14.7	S-36	10	21	12.1	14.8	S-67	10	16	11.1	13.1	S-98	12	19	9.6	11.8
S-6	11	16	11.1	13.1	S-37	12	20	13.1	14.8	S-68	10	18	10.7	12.8	S-99	12	19	10.2	12.5
S-7	10	17	8.3	11.8	S-38	12	21	13.6	15.0	S-69	10	17	10.8	13.0	S-100	8	20	8.8	11.1
S-8	10	17	10.6	12.3	S-39	6	20	10.6	12.1	S-70	10	17	11.7	13.7	S-101	9	17	9.4	11.2
S-9	12	18	11.0	13.7	S-40	5	9	9.1	10.7	S-71	8	18	12.3	14.5	S-102	8	12	10.2	12.2
S-10	12	20	11.6	14.3	S-41	6	10	8.2	9.7	S-72	7	17	12.2	14.6	S-103	8	13	10.7	12.5
S-11	11	20	12.1	14.1	S-42	5	14	9.4	11.5	S-73	7	17	8.5	10.0	S-104	7	13	10.5	12.6
S-12	11	15	11.0	13.2	S-43	8	19	9.4	10.8	S-74	9	17	9.7	12.2	S-105	6	14	10.7	12.6
S-13	9	19	9.2	11.5	S-44	11	20	11.1	14.6	S-75	10	16	11.3	13.3	B-1	7	32	9.3	11.2
S-14	9	18	9.2	11.5	S-45	12	20	11.7	14.7	S-76	9	17	10.8	12.6	B-2	11	12	9.7	11.2
S-15	8	19	10.0	11.8	S-46	11	19	12.0	13.8	S-77	8	16	11.2	13.0	B-3	12	13	11.0	13.3
S-16	8	17	9.8	13.7	S-47	6	17	12.8	14.8	S-78	10	20	10.5	12.2	B-4	11	12	10.6	12.5
S-17	9	18	10.0	13.1	S-48	6	20	11.5	14.5	S-79	6	15	10.2	12.8	B-5	11	13	10.0	12.5
S-18	10	17	10.3	12.1	S-49	6	14	6.8	8.6	S-80	7	14	10.2	11.7	B-6	10	12	10.6	12.6
S-19	10	17	9.3	11.3	S-50	7	13	8.6	10.7	S-81	6	13	7.1	9.4	B-7	11	13	10.7	12.7
S-20	7	16	9.7	11.7	S-51	9	15	10.0	13.0	S-82	6	12	8.7	10.7	B-8	11	12	9.3	10.7
S-21	11	18	9.7	11.3	S-52	10	18	12.5	14.2	S-83	9	16	10.6	12.5	B-9	6	7	6.6	8.0
S-22	10	19	10.0	12.3	S-53	14	20	12.2	13.5	S-84	8	17	10.0	12.1	B-10	5	6	6.1	8.3
S-23	10	17	11.8	14.2	S-54	12	20	12.3	13.7	S-85	9	17	10.0	11.8	R-1	10	12	6.6	11.6
S-24	10	17	11.8	14.5	S-55	11	18	11.3	14.1	S-86	10	15	10.3	12.2	R-2	9	12	8.8	10.6
S-25	8	13	10.5	12.6	S-56	11	19	10.8	12.7	S-87	10	14	10.2	12.6	R-3	10	11	9.2	11.1
S-26	8	11	9.3	11.3	S-57	7	18	11.3	13.6	S-88	11	16	10.0	12.8	R-4	10	11	10.2	13.0
S-27	6	15	10.2	12.2	S-58	8	15	9.1	11.7	S-89	9	15	9.8	12.1	R-5	11	12	11.1	12.8
S-28	13	17	9.7	12.2	S-59	10	18	11.2	13.1	S-90	9	15	10.5	13.1					
S-29	13	20	12.5	14.6	S-60	11	18	12.5	15.0	S-91	7	13	10.5	12.6					
S-30	11	20	13.5	14.8	S-61	10	19	13.2	15.1	S-92	7	15	9.4	11.7					
S-31	10	20	12.3	14.7	S-62	13	19	12.6	14.2	S-93	8	15	10.0	11.7					

NOTE: cpm equals counts per minute. Average background values from three off-site locations were 10,800 cpm for gamma scanning and 10.4  $\mu\text{R}/\text{h}$  for external gamma exposure. All measurements shown include background.

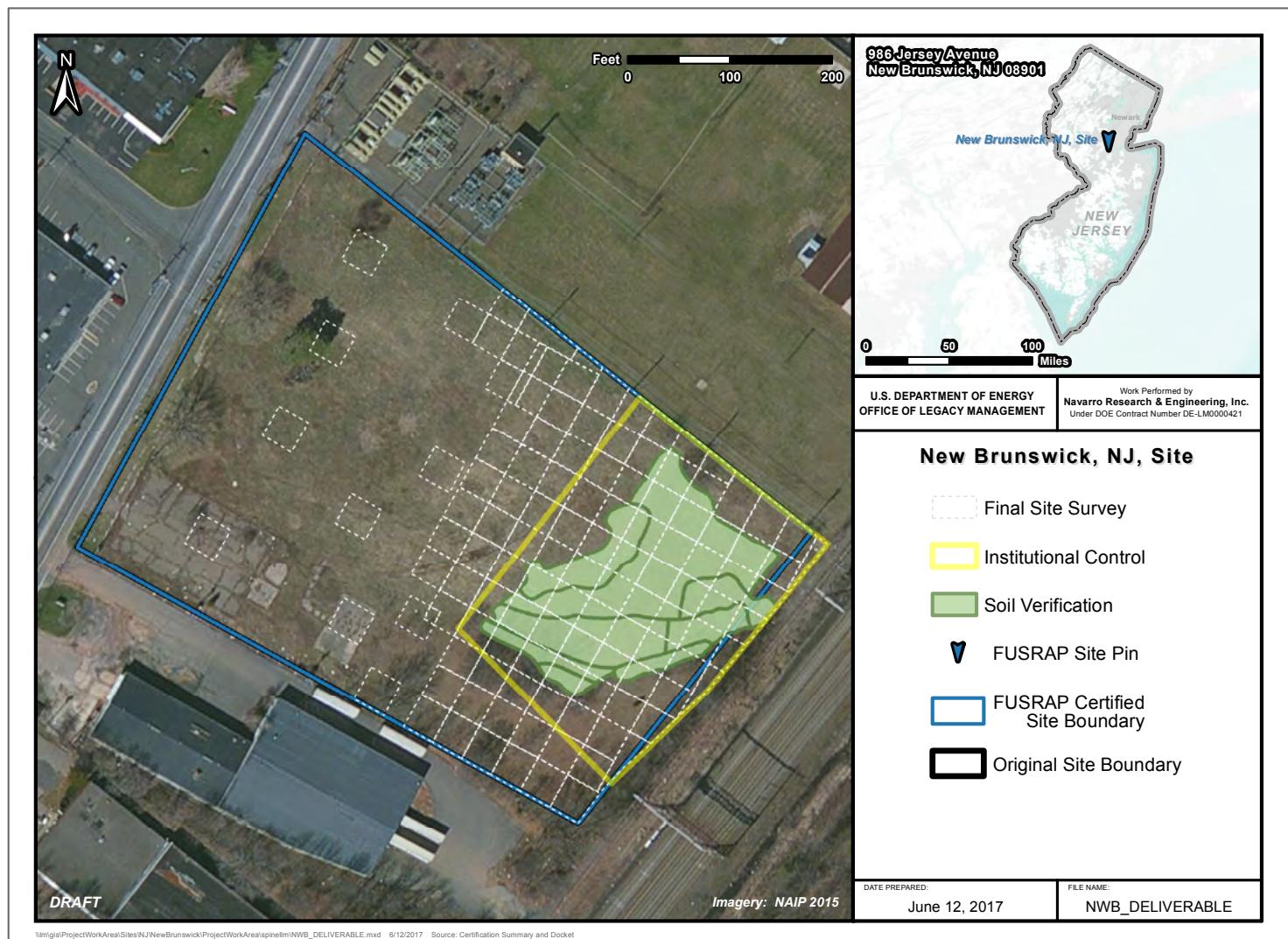








# New Brunswick, New Jersey, Site Map



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